

WHAT IS CLAIMED IS :

1. An x-ray mask blank having at least an x-ray membrane on a substrate,

wherein said x-ray membrane has a surface condition satisfying the following expression (1):

$$(Ra_{\max} - Ra_{\min}) / (Ra_{\max} + Ra_{\min}) \leq 0.15 \quad (1)$$

where  $Ra_{\max}$  denotes a maximum value of  $Ra$  of a surface roughness ( $Ra$ : center-line average roughness) on a plurality of points within a predetermined area on said x-ray membrane, and

$Ra_{\min}$  denotes a minimum value of  $Ra$  of the surface roughness ( $Ra$ : center-line average roughness) on a plurality of points within a predetermined area on said x-ray membrane.

2. The x-ray mask blank according to claim 1, wherein an average of the surface roughness ( $Ra$ : center-line average roughness) on a plurality of points within a predetermined area on said x-ray membrane is 1.0 nm or less.

3. The x-ray mask blank according to claim 2, wherein the surface of said x-ray membrane is a generally uniformly polished surface.

<sup>sup</sup> 4. The x-ray mask blank according to any one of claim 1, wherein said x-ray membrane comprises a silicon carbide film.

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